

FLIGHT

The
AIRCRAFT
ENGINEER
&
AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:—

1926	
Jan. 21	Maj. J. S. Buchanan. "The Schneider Cup Race, 1925," before R.Ae.S.
Jan. 26	Lieut. Olechnovitch. "The Care and Maintenance of Tools as an Important Factor in Workshop Routine," before Inst.Ae.E.
Feb. 4	Joint Meeting of R.Ae.S. and Inst.Ae.E. at R. Soc. of Arts. Mr. C. L. Lawrance, "American Aircraft Engine Development."
Feb. 9	Informal Meeting, Inst.Ae.E.
Feb. 25	Mr. A. J. Cobham. "Long-Distance Aeroplane Flights," before R.Ae.S.
Mar. 4	Maj. G. H. Scott. "Development of Airship Mooring," before R.Ae.S.
Mar. 9	Mr. O. E. Simmonds, M.Ai, A.F.R.Ae.S., M.I.Ae.S. "The Development of Civil Marine Aircraft," before Inst.Ae.E.
Mar. 18	Flight-Lieut. H. Cooch. "Landing Aeroplanes in Fog," before R.Ae.S.
April 13	Mr. S. H. Evans, B.Sc. "The Performance of Modern Aircraft—with special reference to the Variable Wing," before Inst.Ae.E.

EDITORIAL COMMENT.



It is by now an open secret that one of the main causes of the recent amalgamation into one company of the two leading German air transport companies, the *Junkers Luftverkehr* and the *Deutscher Aero-Lloyd*, was the virtual failure of the Junkers concern, due, it is stated in some quarters, to extravagant management. There has been a perfect flood of correspondence on the subject in the German press, daily as well as aeronautical, and feeling has run high, with all sorts of accusations, denials, praises and criticisms. Into this mêlée we do not feel called upon to be drawn. The matter is mainly one for Germany to settle, but that the accusations of bad management cannot very well apply to *all* the Junkers departments is forcibly brought home to one by a recent example of the methods of the *Propaganda Abteilung*.

This takes the form of a supplement to the *Deutsche Motor-Zeitschrift* of December, 1925, in which a brief outline is given of the evolution of the Junkers type of construction from the earliest days to the present time, and concluding with illustrations and particulars of a number of Junkers aeroplanes. The point about the supplement is that it is published in English, and very good English too, even to the extent of using English aeronautical slang terms such as "soggy," if such can be called good English. The supplement is produced on good paper and the illustrations are well printed and very clear. The machine descriptions are confined to a page per machine, with an illustration of the machine at the top of the page and the data relating to the type given in more or less tabular form. As the constructional methods are much the same in all Junkers types, the introduction and historical part covers the fundamental principle, and the tabulated data and photographs give the information necessary to describe the characteristics of each type. The supplement is a most excellent piece of propaganda for Junkers aircraft, and although it may be a part of the extravagant management, it does not point to ineffectual management, in this particular department at any rate.

The extensive use of Junkers aircraft in various parts of the world is evidence of the effectiveness of this propaganda, of which, of course, the supplement is but one small item, but one which is rather illuminating.

♦ ♦ ♦

Purchasing Foreign Aircraft

During the recent discussion on the French aeronautical budget a question was raised which had already been discussed in private for a considerable time. It relates to the suggested purchase by the French Government of foreign aeroplanes. Two members of the French parliament, MM. Henry Paté and Couhé, have made themselves spokesmen for the movement which maintains that it is to the interest of French aviation generally to know exactly the capabilities of foreign aircraft, and that the only way to find these out definitely is to purchase foreign machines and test them under the same conditions as French machines. By such tests the *Service Technique* would, it is claimed, be able to verify the accuracy of the performances claimed for the foreign machines, the information being made available to French aircraft constructors.

Our excellent French contemporary *Les Ailes*, while agreeing with the necessity of knowing exactly what foreign machines are capable of, foresees difficulties, and suggests that a better way might be to admit foreign aeroplanes to French competitions. It expresses the belief that foreign aircraft constructors might, if they knew for what purpose their machine was required, very well refuse to sell, as there would be no likelihood of further orders, and in that case the otherwise excellent suggestions made by MM. Paté and Couhé would fall to the ground. *Les Ailes* states that it knows of French aircraft constructors who refused to sell three aeroplanes of the *avion de chasse* type to an allied government, knowing that two of them would be used for flight tests and the third would be taken to pieces for detail examination. Our contemporary thinks that in all probability a similar attitude might be taken by foreign aircraft constructors asked to sell machines to the French government.

Les Ailes believes that a solution of the problem is not impossible, and that the subject should be seriously studied. In the meantime, it suggests that a good beginning might be made by France renouncing her present policy of keeping her aviation competitions exclusively national, and instead inviting foreign constructors to take part in them. It points out that there is no valid reason why, in like manner to the Paris Salons, a commercial aircraft competition, a seaplane competition or a competition for touring machines, should not be international. Foreign constructors would find it to their own interests to participate and to get the utmost from their machines. The interests of the French aviation world would be served by challenging comparison and benefiting from the results.

The problem outlined above is not, of course, peculiar to France, but is equally applicable to Great Britain, and if one were to substitute, in the above, Great Britain for France, exactly the same case can be made out. We in this country have for some time been purchasing "samples" of foreign aircraft, but the practical difficulties are exactly as outlined by our French contemporary. We do not propose to offer a solution, but the problem is one which

requires study and very careful and diplomatic handling.

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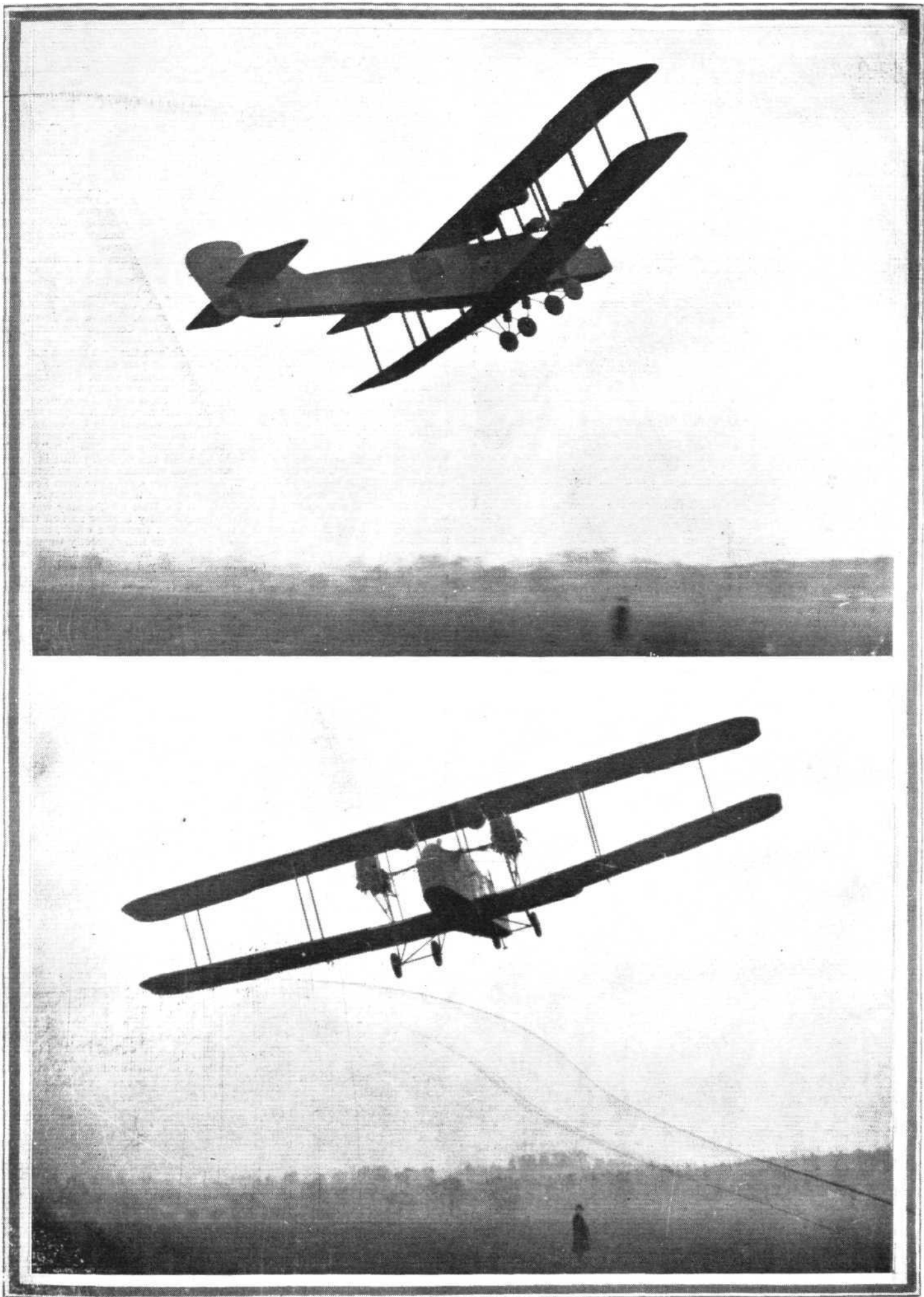
More "Economy" ment these days, but the cry for "economy" is, like the poor, always with us. The latest subject upon which the economists are exercising their ingenuity is that of airship operation. At Pulham and at Cardington men are being dismissed "indefinitely," the proposed reconditioning of R.36 for the purpose of fitting out this airship for a flight to Egypt has been abandoned, and the flying tests, for which R.33 had been prepared, to be carried out in order to compile data urgently required in the design of the new large airships, are to be discontinued. We doubt if the world has ever seen a sorrier spectacle than that of Great Britain playing with airship policies. First we will and then we won't. First the Admiralty refuses to have anything to do with airships, then it is suddenly seized with a violent craving for airships. First the Air Ministry turns down airships as being too costly; then when the Admiralty shows signs of awakening interest, the Air Ministry discovers that it *can* manage an airship policy. Then we go off the deep end and "talk big" about 5,000,000 cubic ft. airships. Then our airship authorities say that the building of such large airships will require first a certain amount of full-scale experimenting. The work is taken in hand and a start is made. Another change of mind, and airship flying is once more closed down. Really it is difficult to know whether to laugh or cry.

Although it is stated that the work on the large 5,000,000 cubic ft. R.101 is to continue, it must be realised that actual flying with existing airships is essential, not only in order to accumulate data, but also for the training of crews. Perhaps, after all, Commander Boothby's suggested light airship club may provide the means of a continuance of airship flying, even if under a somewhat different form, especially as his scheme does not involve any but a very modest expenditure. Otherwise, after all the vacillation shown during the last few years, one is almost tempted to suggest handing the whole of the airship work over to the Navy.

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The Next Schneider Cup Race

We are very glad that the suggestion, made at the meeting of the F.A.I. in Paris recently, that the rules for the next Schneider Cup Race be altered to stipulate that the machines must carry, in addition to the weight of the pilot and the fuel necessary for the race, a certain useful load, was turned down. As we have repeatedly stated, we do not agree with the view that pure speed races are of no value and tend only to produce "freaks." But for such races we should never have evolved machines capable of the speeds now being attained, and as the Schneider race is almost the only international event for pure speed machines, it would, in our opinion, have been a mistake to alter the rules so as to call for larger, heavier, and therefore slower machines. That the rules were not changed is, of course, chiefly due to the firm stand taken by Great Britain's representatives at the meeting of the F.A.I., and we believe that ultimately they will be thanked for this attitude, even by those who now desire to make a change.



MANŒUVRABILITY : Two views of the Handley Page "Hyderabad" night bomber. This machine is fitted with two Napier "Lion" engines. In the flights during which these photographs were taken the machine was piloted by Capt. Wilcockson, who seemed to handle the "Hyderabad" as if it were a scout.

LIGHT 'PLANE CLUB DOINGS

London Aeroplane Club

THE following Members received flying instruction during the week :— Mrs. Elliott-Lynn, C. E. Murrell, R. C. Presland, R. V. Banks, Major Beaumont, G. N. Howe, D. P. H. Esler, S. O. Bradshaw, T. C. Angus, N. Jones, O. J. Tapper, R. C. Brighton, G. W. Quirk, R. L. Preston, S. C. Richards, R. P. Cooper, E. S. Brough, R. Thomas, A. P. Hunt, A. R. Ogston, L. J. C. Mitchell. The following Members flew solo :—Mrs. Elliott-Lynn, Major Beaumont, Col. Turner, G. H. Craig.

The total flying for the week was 17 hours 40 mins.

On Friday, 8th inst. Col. Turner, in carrying out his tests for his Aviator's Certificate, damaged G-EBLU. The figures of eight and landings had been carried out satisfactorily, and the altitude test of 6,000 ft. was completed, and he was alighting with engine cut off. He made a gentle side slip to lose height on approaching the aerodrome, and the lower wing and under-carriage fouled a high part of the aerodrome hedge. The machine swung round immediately into the ground, and was considerably damaged.

Immediately afterwards Major K. M. Beaumont, D.S.O., took out the other "Moth," G-EBLI, and carried out his tests for the Aviator's Certificate in a satisfactory manner.

The extent of the damage to G-EBLU has not yet been definitely ascertained, but in any event it will mean carrying on with one machine for the next few weeks.

Capt. F. G. M. Sparks is taking his Instructor's Course at Upavon, commencing on Monday, January 11, and will be away from Stag Lane for the next fortnight.

The Lancashire Aero Club

FLYING has been possible on only Saturday and Sunday. Mr. Cantrill gave "dual" instruction to :—S. Parker, 20 mins.; T. Wilkinson, 20 mins.; H. Hardy, 20 mins.; J. Leeming, 20 mins.; P. Michelson, 25 mins. Mr. Scholes instructed :—M. Lacayo, 35 mins.; H. Stern, 30 mins.; W. Colley, 25 mins.; P. Tummers, 25 mins.; T. Wilkinson, 20 mins.; S. Crabtree, 20 mins.

Total time flown : 45 hours 55 mins. Ten persons had instruction.

"Joy Rides" are given to members only on the last Saturday of each month, the rest of the time machines are kept exclusively for dual instruction and pupils' solo. Flying Members are asked to note that there are now vacancies on the Instructor's Lists, and those wishing to commence should attend at the Aerodrome to make arrangements. All Flying Members are eligible for instruction.

The Club's Avro presented by Col. M. O. Darby is being reconditioned, and it is hoped will be flying shortly. Early delivery has been promised of the Avro given by Sir Wm. Letts, and also the "Moth" presented by Sir Charles Wakefield. The solo pilots may stop worrying about any shortage of machines in the spring. They forecast gloomily visions of hordes of members swarming down on the aerodrome when the spring arrives, and of themselves fighting a desperate battle to retain a machine from the grasp of these rapacious pupils. We wish to point out to them that there will be three "Moths" and two Avros in use, so that they will have a chance of a flight. Should there prove a shortage of machines, the Club's tame "Gift enticer" may be relied upon to discover further generously-minded citizens.

The Newcastle-upon-Tyne Aero Club

FLYING REPORT for week ending Sunday, January 10, 1926 :—Total flying times : LX, 18-36; LY, 5-11; total, 23 hrs. 47 mins.

The following members had dual instruction under Major Packman :— Mr. H. H. Leech (32 mins.), Mr. J. M. Davidson (3 hrs. 52 mins.), Mr. A. E. George (30 mins.), Mr. J. A. Somerville (2 hrs. 20 mins.), Mr. G. H. Twine (30 mins.), Mr. L. Smith (30 mins.), Mr. A. D. Bruce (15 mins.), Mr. C. Thompson (25 mins.).

Secondary dual instruction.—Mr. Leech (1 hr. 35 mins.), Mr. W. T. Walton (1 hr. 22 mins.), Mr. Stobie (10 mins.), Mr. J. D. Irving (45 mins.), Mr. R. N. Thompson (35 mins.). Solo : Mr. Leech (10 mins., first solo), Mr. Walton (2 hrs. 10 mins.), Mr. J. D. Irving (1 hr. 50 mins.), Mr. R. N. Thompson (2 hrs. 53 mins., includes tests for Pilot's Certificate). Flights by "A" Pilots : Mr. Stobie (50 mins., 2 flights), Mr. Baxter Ellis, with Mr. A. M. Sutherland as passenger (48 mins.), Mr. N. S. Todd (15 mins.), Mr. Forsyth Heppell, 30 mins, with Mr. Young as passenger, 20 with Mrs. Heppell, and 10 with Miss Coppett. Tests by Major Packman, 15 mins. Passenger flights with Major Packman : Miss Zollner, Miss Noble and Lieut. Bridges, each 5 mins.

The weather mixture this week has consisted of fairly equal parts of fog, rain and high winds, but a lot of very useful flying has been carried out, though Thursday was a blank day.

Tuesday was an important day in the history of the Club, it being the first occasion on which two members have been "launched" solo on the same day. Mr. J. D. Irving and Mr. H. H. Leech, each making their first flights alone, and both made very good performances. Mr. R. N. Thompson carried out the first part of his tests for his Pilot's Certificate, making his figures of eight in grand style.

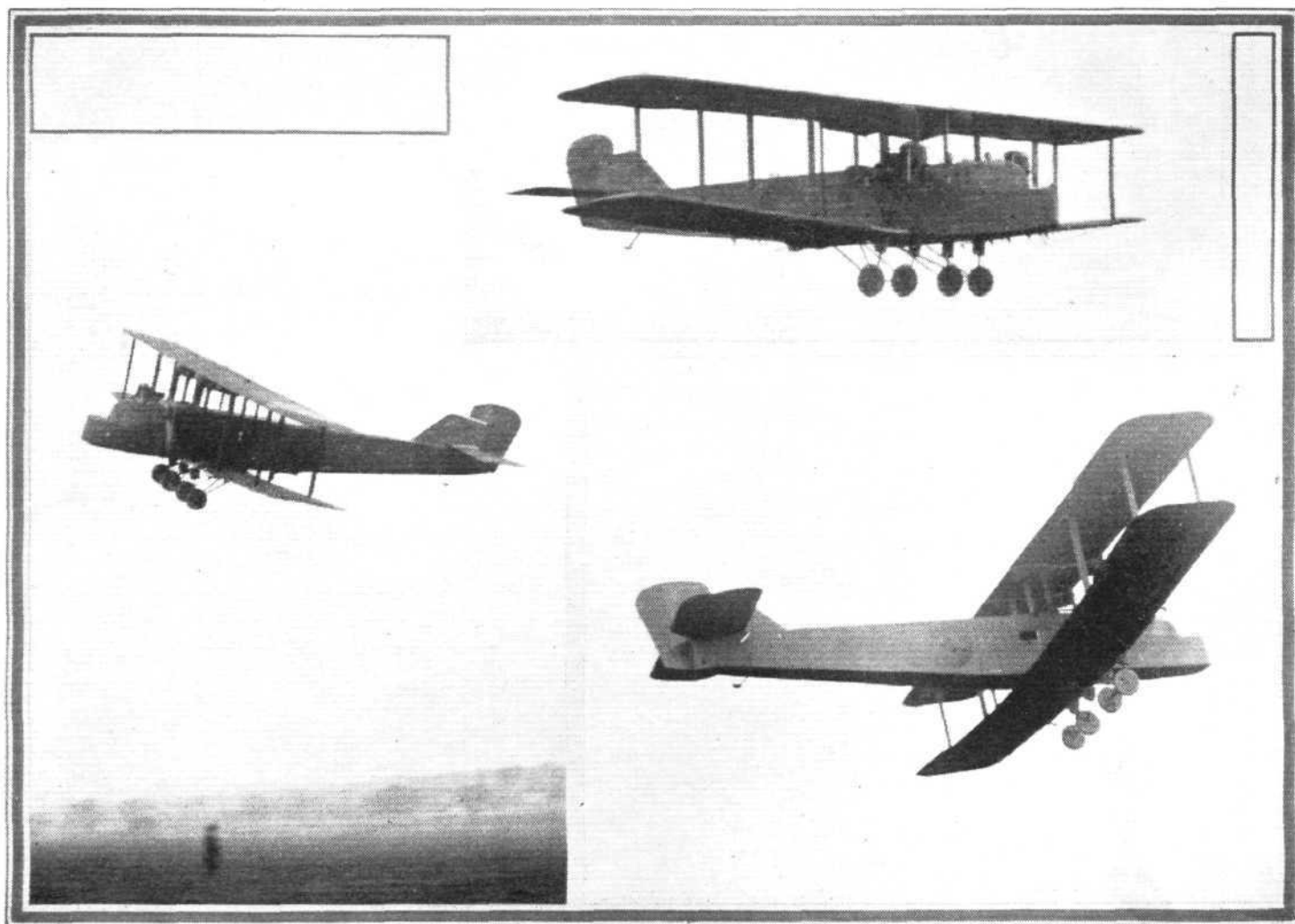
Wednesday was also an historical day, as this was the first time a member had dared to shed an undercarriage. The honour goes to Mr. Irving, who, after making his third solo of 45 minutes in excellent style, misjudged his landing, with the usual result. Mr. Irving has taken matters very seriously throughout, having been in no hurry to fly alone, and has put in a lot of dual flying, including dozens of landings almost faultlessly, and it is just a piece of bad luck. Mr. Irving was back at it on Saturday, and in the course of a flight with Major Packman, made very good landings every time.

The Club is now reduced to one Moth, the hardy LX (and the "Gull," which, like all good aeroplanes, is held up until the engine, which is being overhauled, arrives), but there has been a good attendance of members and, since the accident nearly 15 of the 23 hours for the week have been flown.

Mr. Thompson carried out the second part of his tests in good style.

The reason he was unable to complete all his tests on Tuesday was that while he was doing his figures of eight the visibility became so bad that it was impossible for him to see one turning point from the other, and just in case the observer might have any doubt that he had correctly turned one point at any time, he proceeded after completing five to "do a few more," finally, completing 10 figure eights. Wednesday being much better, he carried out his height test.

Mr. MacKay, Mr. Walton and Mr. Leech now only await suitable weather to complete their tests, so LY should be kept very busy when she returns from the hospital. The four "A" pilots of the Club have all flown during the past week.



["Flight" Photographs.

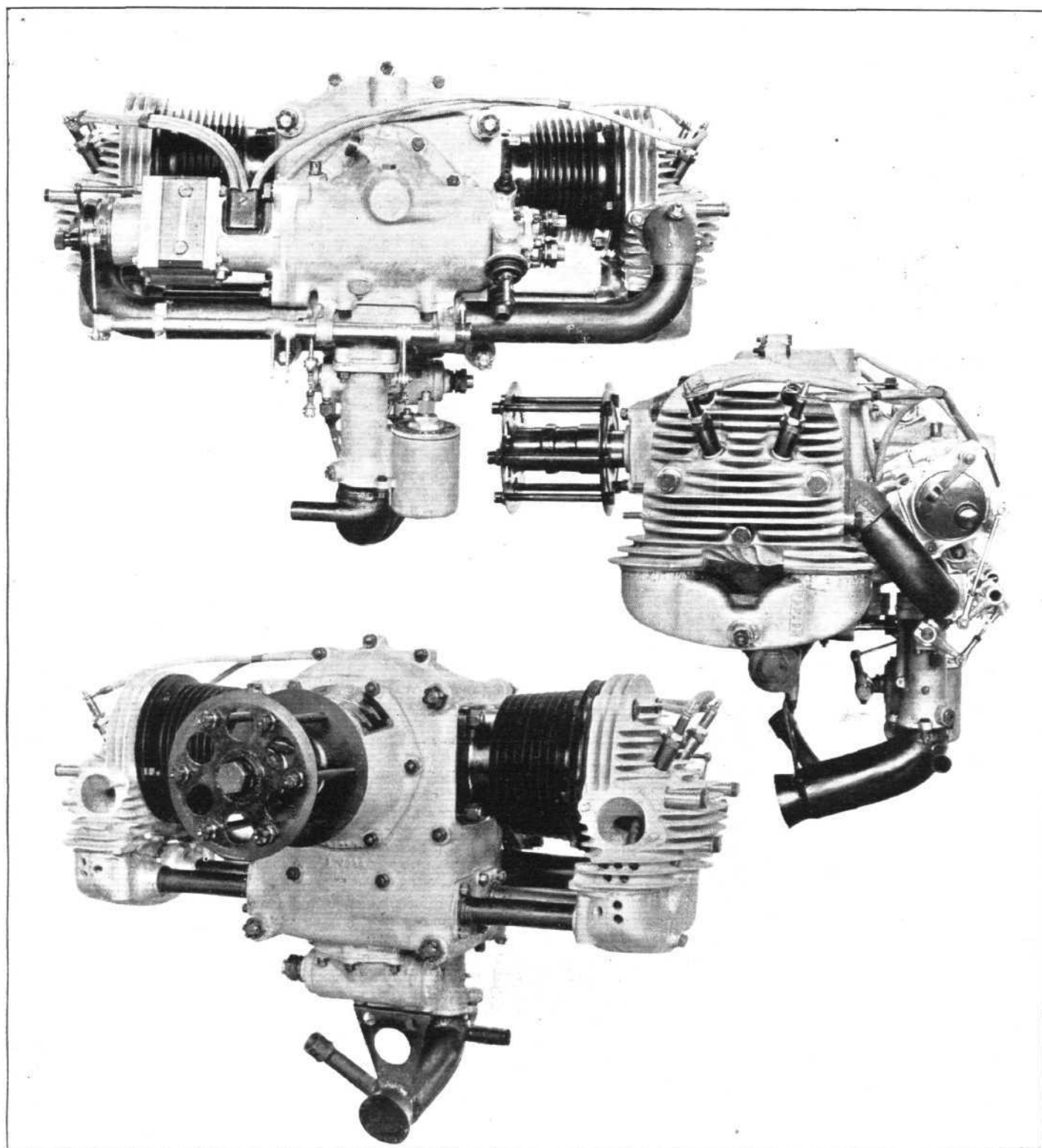
THE HANDLEY PAGE "HYDERABAD" : These three views show the machine from different angles and give a good idea of the general lay-out, which is based upon that of the commercial W.8 type, although certain minor changes have been made for the use of the machine as a night bomber.

THE NEW BRISTOL "CHERUB"

Series III Light 'Plane Engine Passes 100 Hours Type Tests

As a result of the outstanding successes of the original Bristol "Cherub" engines in the 1924 and 1925 Lympne Light 'Plane meetings, and other competitions in Germany and the United States of America, the Bristol Aeroplane Company decided to develop this engine further, with the idea of putting it on a basis fully equal to the best modern large aero engines as regards reliability and performance. Although there were those who doubted the possibility of obtaining real reliability in a small very high speed light 'plane engine, the Bristol Company has managed, by taking advantage of their valuable experience gained in competition work, by careful re-designing,

and as a result of nine months of development work, to produce a small light engine, which compares well with aero engines of more than ten times the power. Thus the "Cherub" series III develops a normal power of 33 b.h.p. at 2,900 r.p.m., and a maximum of 36 b.h.p. at 3,200 r.p.m. The weight of the engine is only 95 lb., or 2.88 lb. per h.p. on normal power. At the same time the fuel and oil consumptions are low, the former averaging 2 galls. per hour and the latter 1 pint per hour, both at normal speed and power. That the reliability claimed for it has been attained in the "Cherub" III is proved by the fact that one of these engines has passed



THE LATEST "CHERUB": These three views illustrate the Series III engine, which has recently passed the Air Ministry's 100 hours' type test.

the 100 hours type tests imposed by the Air Ministry. Any engine capable of passing successfully this severe test may be assumed to have left the experimental stage behind it.

Changes in Design.

A brief outline of the changes in design which have been incorporated in the series III "Cherub" may be of interest, the older "Cherub" being already familiar to readers of FLIGHT. To begin with, the bore has been increased to 90 mm. and the capacity to 1,228 c.c. The cylinder heads have been re-designed, and have new type valves with triple-valve springs. An extra gas ring has been added to the pistons, and a scraper ring of new design is used. The crankcase has been re-designed with dry sump, and is now more robust, smaller and more symmetrical. There is now a full floating bush big end bearing, and the lubrication system is of the full pressure type by engine-driven duplex gear pump, one suction and one pressure unit. The rear of the engine has been modified to allow easier attachment of engine mounting, and a special "Cherub" type of Zenith carburettor is tucked up more snugly to the engine, with new float mechanism. The ignition control is automatic, inter-connected with the throttle. The altitude control is inter-connected with the throttle so as to ensure automatic return to ground position when throttle is closed.

The Type Tests.

Concerning the Air Ministry Type Tests, which took place in December last, the essential information may, perhaps, best be given in the form of tables. One of our illustrations this week shows the power, etc. curves taken before and after the type tests, from which it will be seen that the power given at the end of the 100 hours was greater than before the test. Attention may also be drawn to the fact that the official report on the condition of the engine after being stripped stated that "The general condition of the engine was excellent."

A synopsis of the type tests is as follows: First run of 1½ hours on Froude dynamometer, during which the first power curve was taken; 40 hours on Froude at 90 per cent. power at 2,900 r.p.m.; 50 hours on hangar at 90 per cent. power, at

2,900 r.p.m.; 9 hours on Froude at 90 per cent. power and 2,900 r.p.m.; 1 hour on Froude at full power and 2,900 r.p.m.; 1 hour on Froude at high speed of 3,350 r.p.m.; 10 mins. on Froude, slow-running at 890 r.p.m.; 1 hour on Froude, high power of 36.9 b.h.p., at 3,190 r.p.m.; and finally 1½ hours on Froude, during which second power curve was taken.

Details of 100 hours Test at 2,900 r.p.m.

The following table shows particulars of the 100 hours test:

Hours Run	Power at non-stop.	Average Consumptions.				
		End.	Fuel.	Oil.		
		Gals./h.	Pts./hp./h.	Pts./h.	Pts./h.p./h.	
1	10	34.2	1.94	0.59	1.22	0.046
2	10	34.5	1.9	0.58	0.98	0.037
3	10	34.5	1.9	0.58	0.612	0.023
4	10	34.2	1.93	0.59	0.570	0.022
5	10	Hangar	1.94	—	0.625	—
6	10	Hangar	1.94	—	0.75	—
7	10	Hangar	1.92	—	0.56	—
8	10	Hangar	1.91	—	0.48	—
9	10	Hangar	1.94	—	0.42	—
10*	10	34.2	1.91	0.58	0.58	0.022

* The last hour of this run was at full power. The fuel used was 60 per cent. petrol and 40 per cent. benzol. The average consumptions for the 100 hours were: Fuel, 1.92 gals. per hour = 0.586 pts./hp./h. Oil: 0.68 pints per hour = 0.026 pts. h.p./h.

The following table shows the average wear on major components during the 100 hours' type tests:—

Component.	Average Wear.
Cylinder Bore	0.001
Piston Skirt	0.0015
Piston Pin Bore	Nil
Gudgeon Pin Diameter	Nil
Con. Rod Small End Bush Bore	0.0027
Con. Rod Big End Bush Bore	Nil
Crankpin Floating Bush O Dia.	Nil
Crankpin Floating Bush I Dia.	0.0007
Crankpin Diameter	0.0003
Crankshaft Rear End	Nil
Cam Timing Internal Wheel	0.0001
Camshaft	0.0002
Rocker Box Bush	0.0002 oval
Rocker Shaft Diameter	0.0005 oval
Cam Fingers	0.0008
Valve Guides	Nil

It will be agreed that the above figures are very good indeed, and that the "Cherub III" withstood the very searching test with flying colours.

GENERAL DESCRIPTION

The "Bristol" Cherub engine is of the two-cylinder opposed type, and has a total swept volume of 1,228 c.c.

The bore and stroke are 90 mm. and 96.5 mm. respectively.

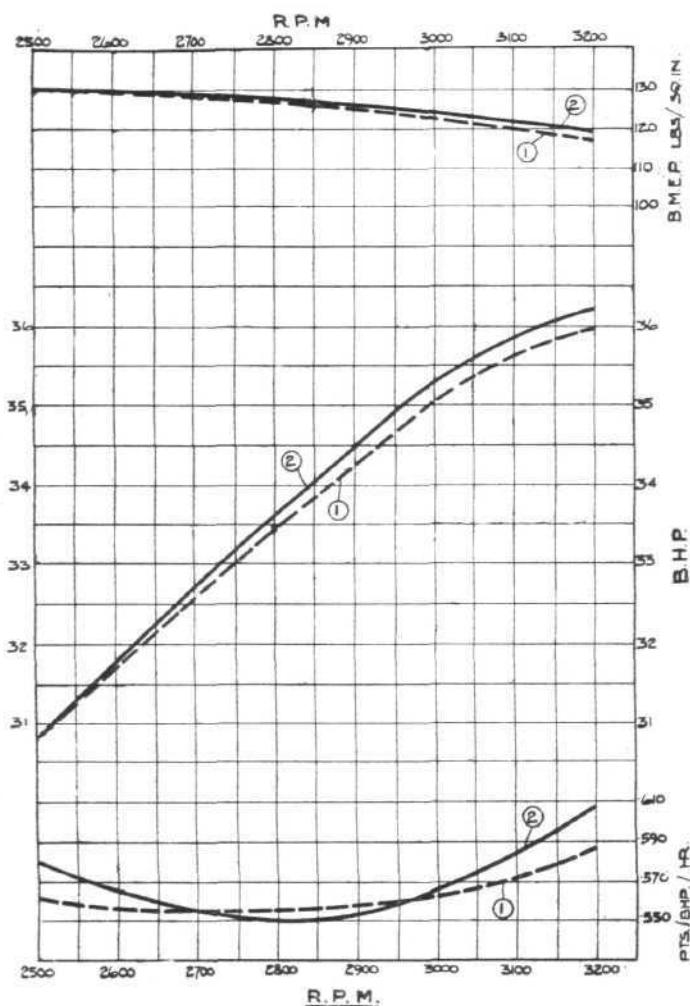
Crankshaft.—The crankshaft is a case hardening alloy steel stamping of ample dimensions, carried in four bearings; the crankcase is an aluminium casting, split vertically on the engine centre line, and provided with separate front and rear covers.

Bearings.—There are three main journal bearings. The front one is of the deep groove type, located in the nose of the conical front cover, and transmits the propeller thrust from the crankshaft to the case. The other two are of the double-row self-aligning type, and situated adjacent to the crank throws, one in front and the other behind, and are housed in the front and rear half crankcases respectively. The tail end of the shaft is supported in the rear cover by a plain white metal bearing, which provides an oil seal, allowing oil to be supplied through the hollow tail end and drilled oilways to the big end bearings. On the shaft between the two rear bearings a spur wheel and two spiral gear wheels provide drives for the camshaft, tachometer and magneto and oil pump, respectively.

Connecting Rods.—Connecting rods are alloy steel forgings with hardened liners, pressed into the big ends, the proportions of which are such that the rods may be threaded over the shaft. When in position, the split bronze floating bushes are inserted and the two halves secured to each other by high tensile steel screws which are locked by split pins.

Pistons.—The pistons are of aluminium alloy fitted with three rings, the lower one of which serves as a scraper and returns surplus oil from the cylinder walls through drain holes in the piston skirt. The hollow gudgeon pins float both in the piston bosses and in the connecting rod small ends and are located endways by bronze buttons pressed into their open ends.

Cylinders.—The cylinders have steel barrels, but the inlet



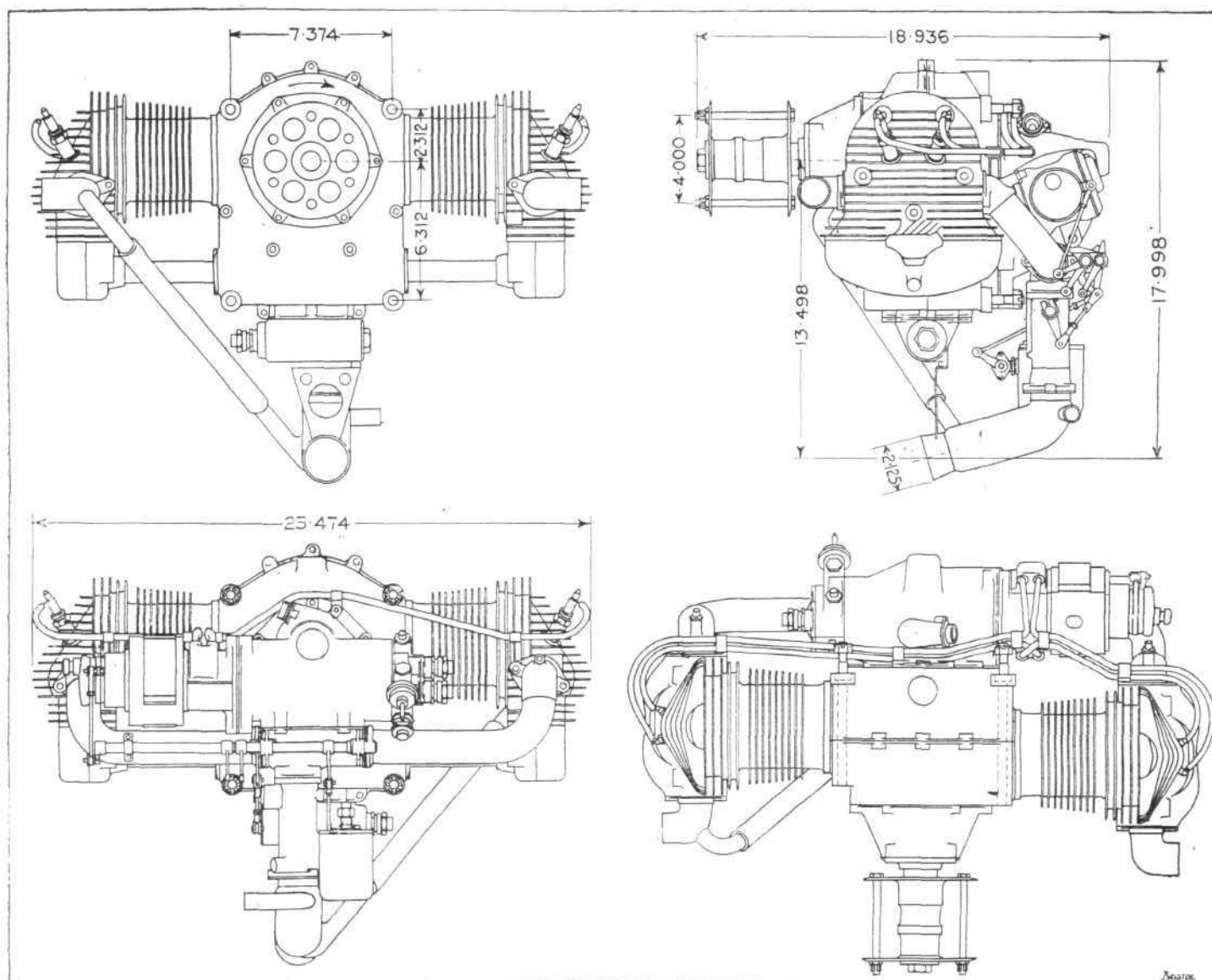
Power curves of the Bristol "Cherub," Series III: Curves No. 1 show readings taken before the 100 hours type tests, and curves No. 2 readings taken after the type tests. The fuel used was 60 per cent. petrol and 40 per cent. benzol.

and exhaust passages are formed in the aluminium alloy heads which also carry the screwed-in alloy steel valve seats, valve guides, valves and springs. A deep spigot for the head is provided on the barrel with a flange to which the head is bolted. The spigot protects the vital joint which is formed by a copper ring spigotted and very carefully fitted in annular grooves cut in the head and barrel flanges. As the rates of expansion of aluminium and steel are different great difficulty is usually encountered in the maintenance of a really gastight joint with this type of head. In the Cherub heads, this difficulty has been entirely overcome by inserting packing pieces of a special alloy, having an unusually low rate of expansion between the cylinder heads and the heads of the securing bolts. This arrangement combined with the copper ring joint has proved so satisfactory that the ends of the bolts are riveted over on their

by a length of shafting. As the valve stems project from the cylinder heads radially relative to the cylinder bore, any difference between the expansion of the cylinder and that of the rocker shaft merely moves the valve stem slightly across the face of the operating rocker, but does not alter the valve clearance. A torsion spring fitted to the rocker shaft keeps the cams, finger, and operated rocker in contact, and the whole valve gear is entirely enclosed.

Magneto.—As already mentioned, the magneto is driven by spiral gears from the rear end of the crankshaft. It is mounted on the rear cover by a flange and spigot, and lies behind and parallel to the port side cylinder with the contact-breaker readily accessible. The magneto is a double-pole double-slip-ring type which fires two plugs in each cylinder. It is fitted with an impulse starter to render starting easy.

Lubrication System.—The oil pump is located behind the



THE BRISTOL "CHERUB," SERIES III: These four views, with main overall dimensions given, should provide sufficient data for designing mountings and cowling for the engine.

nuts, the head and barrel being regarded as one unit which need never be disturbed. The cylinders are secured to the crankcases by a spigotted and flanged joint, a Dermatine ring serving to make the joint oil-tight.

Valves.—Inlet and exhaust valves are of cobalt-chrome steel and are interchangeable, and three concentric springs are used on each valve. The valve-operating gear is somewhat unusual, and has distinctive features of considerable importance.

The camshaft which, with its four cams, is machined from the solid, runs across the crankcase below the crankshaft, and is driven by plain spur gears of ample dimensions. The cams are of the constant acceleration type. The valves are operated by rocker shafts which run parallel to the cylinder axes from crankcase to cylinder head. These may be regarded as the precise equivalent of the normal type of rocker arm which is interposed between camshaft and valve in the overhead camshaft type of engine, with the single difference that a rocker which is operated through a finger, by the cams, is separated from that which operates the valves

starboard cylinder in an extension of the magneto housing on the rear cover, where it also is readily accessible, and is driven by the same spiral gears that drive the magneto. It is detachable as a complete unit, and consists of two independent gear pumps. At the bottom of the crankcase is provided a detachable oil sump containing an easily removable oil filter. The larger of the two pumps draws oil drained from the crankcase through this filter, and returns it to the tank via a filter in the bulkhead, and supplies it under pressure through drilled oilways to the big-end bearings and the bushed bearings of the camshaft and intermediate wheel. This pump is provided with a spring-loaded pressure adjuster, the by-passed oil being returned to the suction side of the pump. The spiral gears are adequately lubricated by oil collected in a well into which the lower gear dips. The bearings of this gear are automatically lubricated by the oil which flows from a similar but smaller well, special provision being made to prevent leakage through this bearing into the magneto housing. The oil pressure is 40 lb. per sq. in.

Carburettor.—The carburettor is a special type of Zenith,

with hand-operated altitude control of the extra diffuser air type and is bolted to a cast aluminium induction T-piece, which is attached by studs and nuts to a broad facing on the underside of the magneto and pump housing on the rear cover. The throttle and magneto advance and retard are inter-connected by a suitable arrangement of levers and links. The altitude control is independent except that it is closed automatically if the throttle is closed. The air intake

to the carburettor is an exhaust jacketed steel elbow. The induction pipes run from the T-piece parallel to the cylinders, and are fitted into it with airtight expansion joints, and are provided with bosses to take primer jets.

Mounting.—The engine is mounted from screwed extensions on the ends of the four crankcase bolts at each corner of the crankcase. A standard connection for a tachometer is arranged on the port side above the magneto.

EXPERIMENTAL STRESS ANALYSIS.

THE paper on the above subject, read before the Royal Aeronautical Society on January 7 by Prof. A. J. Sutton Pippard, M.B.E., D.Sc., F.R.Ae.S., was in many ways a most remarkable one, but unfortunately it was of such a technical character as to preclude any possibility of making a useful résumé of it for the benefit of readers of *FLIGHT*, and we can only advise those interested in the subject to obtain the forthcoming issue of the Royal Aeronautical Society's *Journal*, in which the paper will be published in full.

Prof. Pippard is, of course, an authority on matters pertaining to stress calculations, and it may be recollected that he is the joint author with Mr. J. L. Pritchard of the book "Aeroplane Structures," which has become the recognised text-book on the subject of aeroplane stress calculations in this country.

In his paper Prof. Pippard referred to the report of the Accidents Investigation Sub-Committee of the Aeronautical Research Committee, and quoted from this report the following passage: "The existing methods of calculation at present in use for determining the scantlings of structural members of an airship are insufficiently accurate for the purpose, and more exact methods should be developed."

The lecturer then briefly recalled the formation of the Airship Stressing Panel, under the Chairmanship of Mr. R. V. Southwell, and the published report of the Aeronautical Research Committee (R. & M. 800) containing certain results of the work of the Airship Stressing Panel. He pointed out that these results were only obtained by the introduction into the analysis of various simplifying assumptions, the validity of which required checking. The Panel recommended that experiments should be initiated on models representative of the structure of a rigid airship, as a check on the theoretical results of their report.

At the end of 1923, Prof. Pippard, who was then in a position to undertake experimental work, suggested to the Aeronautical Research Committee that he should carry out a research into the properties of redundantly braced frameworks. This course was agreed to, and the experimental work was begun almost immediately, and has proceeded continuously up to the present date at Cardiff University College. It was with the results of these experiments that Prof. Pippard's paper dealt.

Prof. Pippard then referred briefly to a series of investigations commenced by Mr. Southwell, inspired by the problems of the torsional stresses in an aeroplane fuselage, and gave an outline of this work.

The lecturer then showed slides illustrating the model used by him in his experiments, which was a framework three bays in length, each bay being 30 in. long. In section the framework was hexagonal, the side of the hexagon being 25 in. As the theoretical analysis had been based on the assumption that the structure was pin-jointed throughout, an attempt was made to design a suitable joint of this type. It may be imagined that to design a frictionless joint in which there should be no fixing factors would have been well-nigh impossible, and ultimately a suggestion made by Mr. Southwell that the members of the structure should be attached to the joints by short dowels or pins was adopted. Preliminary tests on these joints indicated that the dowels might be relied upon to serve as a satisfactory means of attachment without introducing any serious fixing effect.

Accurate means for measuring the stress in all the members of the structure were essential, and for this purpose none of the standard types of extensometers were suitable, and consequently a special instrument had to be designed, and this was done in collaboration with the Cambridge Instrument Co., Ltd. The result was a micrometer microscope which gave the high degree of accuracy required.

A series of experiments on the stresses in various members in this structure under various loads was then described, but space does not permit of referring to these in detail, and all that is possible here is to give the general conclusions arrived at by Prof. Pippard, which were as follows:—

"1. When a tubular framework with redundant bracing is provided with efficient bracing in the plane of the applied load system, the stresses in the members tend quickly to

become independent of the arrangement of the load system.

"2. The provision of additional bracing in other planes parallel to that of loading produces a much quicker equalisation of stresses.

"3. Unless efficient bracing is provided in the plane of loading to act as an initial distributor of the external load, even if the tube exhibits a high degree of redundancy in other planes, the process of equalisation is a very slow one, and the stresses even at a distance from the plane of loading would be dependent to a considerable extent upon the arrangement of the load system.

"4. If in the design of such structure (e.g., the hull of a rigid airship) formulae are used which determine the stresses in the members in terms only of the resultant actions at the section considered, it is important that effective bracing should be provided in the plane of the load system. Unless this is done there is a very serious liability of error."

Effect of Non-operating Members

In conclusion the lecturer dealt with the case when certain members of a framework are capable of resisting compression only up to a definite value, such as slender struts in which the load will increase as the external load is increased until its magnitude reaches the Euler critical value, after which it will bow, and the load remain constant at the critical value. In the case of an initially tensioned wire, the member behaves as a strut until the induced compression just balances the initial tension. It then ceases to function and is no longer an integral part of the framework.

"A framework containing such members," the lecturer said, "presents difficult problems, since all members are operative under small external loads and the structure may exhibit a high degree of redundancy: under large external loads it may reduce to a simply stiff frame, while intermediate loads may produce any degree of redundancy between these extremes."

For practical stress analysis, it was generally sufficient to take account of the two extreme cases, but in the design of rigid airship hulls the work involved was prohibitive. Approximate methods had been given by the Airship Stressing Panel in R. & M. 800, but while this analysis was legitimate for normal flight conditions of loading, some or all of the counter-bracing panel wires resisting compression might become inoperative under exceptional loads. It was essential that the stresses in the frame under the extreme loading conditions should be known. A method had been suggested by Mr. Southwell by which such stresses could be simply deduced from a knowledge of the stresses in the various members of the framework in its normal fully redundant state. To apply this method it was necessary to calculate the loads in all members of the framework under the extreme conditions, assuming it to be fully redundant and all members capable of resisting compression of any required amount. In order to obtain such conditions, external forces were imagined to be applied to the joints connected by the members, of such magnitude as to reduce the hypothetical stresses in them to the actual values. An example was given in which reversed loads were superposed on the panel, and it was pointed out that if this superposition were made for each panel in a framework and the complete structure analysed under such superimposed loads, an exact solution of the problem would be obtained, but the work would be heavy. It was therefore suggested that each panel should be treated as if it were an independent frame. If this were done the work was very easy, but it necessitated an assumption that required check to determine the degree of approximation involved. During his experiments Professor Pippard made a check of this point, and the check showed that the general agreement was good. It was therefore concluded that the method described was sufficiently reliable to give a good indication of the stresses in the extreme condition when redundant members had ceased to operate. Finally Professor Pippard referred to some experimental work now in progress, in which the longitudinal members of the model structure were continuous instead of being pin-jointed at the transverse frames.

AIR LINES IN SOUTH RUSSIA

THE following particulars of the air lines operated in South Russia by the "Ukrvozdchput" Co. (the Ukraine Air Transport Co.) during 1925, published in a recent issue of the "Soviet Press," may be of interest.

The "Ukrvozdchput" Co. opened its first air line, between Kharkov and Kiev, on April 15, 1925, and by June 15 was regularly operating air lines over some 2,000 kms. (1,240 miles), connecting Kharkov with Moskva (Moscow), Kiev, Odessa, and Rostov-on-Don. During that time and up to July 15 the company had only five aeroplanes and four spare engines.

During the summer regular services were operated, three times a week, on two lines:—

- (1) Moskva—Kharkov—Rostov-on-Don.
- (2) Kiev—Kharkov—Odessa.

The first route, which includes a total distance of about 1,070 kms. (663.5 miles), is divided into the following main stages: Moskva—Orel (aerodrome), 320 kms. (198.4 miles); Orel—Kharkov, 350 kms. (217 miles); Kharkov—Artemovsk (aerodrome), 205 kms. (127 miles); and Artemovsk—Rostov-on-Don, 195 kms. (121 miles). In between are the following control stations or intermediate halts: Alexin (Tula), Malo Archangelsk, Kursk and Oboyan. This route was operated as follows: machines left Moskva at 6.30 a.m. and arrived at Kharkov at 11.50 a.m. and at Rostov-on-Don at 4.20 p.m., three stops being made at Orel, Kharkov and Artemovsk. As the stops at these places amounted to about 2 hours, the total distance of 1,070 kms. (663.5 miles) was thus covered in 8 hours, or at an average speed of 135 kms.p.h. (83.7 m.p.h.).

The second route, Kiev—Odessa, of 1,020 kms. (632.4 miles), which, as may be gathered from the accompanying sketch map, more or less doubles back on itself, is divided into the following main stages: Kiev—Poltava (aerodrome), 310 kms. (192 miles); Poltava—Kharkov, 120 kms. (74.4 miles); Kharkov—Ekaterinoslav (aerodrome), 200 kms. (124 miles); and Ekaterinoslav—Odessa, 390 kms. (241.8 miles). Control stations are located at Lubny and Krivoy Rog.

On the second route machines left Kiev at 7.45 a.m. and reached Odessa at 6.15 p.m., stops having been made at Poltava, Kharkov and Ekaterinoslav, and the actual flying time being 9½ hours.

An efficient meteorological service was organised in connection with these lines, reports being obtained daily from the Kiev Central Meteorological Office, from Moskva, and other stations along the routes, where pilot balloon ascents were carried out.

At present the "Ukrvozdchput" company's air fleet consists of six Dornier "Komet III" high-wing monoplanes and 13 Rolls-Royce "Eagle VIIa" engines. An additional Dornier "Komet III" was ordered towards the end of

last year, and has probably been delivered by now, while the "Krasny Letchik" factory is shortly to supply Soviet-constructed aeroplanes fitted with 100 h.p. Bristol "Lucifer" engines.

In conclusion it may be noted that the flying personnel of the "Ukrvozdchput" company is all highly qualified.



AIR LINES IN SOUTH RUSSIA: Sketch map showing the air routes operated during 1925.

Minor repairs are effected at the workshops at Kharkov, and big repairs are carried out at Moskva under the supervision of Mr. Holt, a representative of the Rolls-Royce firm and a member of the "Derluft" staff.

The use made of these air services had been very satisfactory, so much so that in the near future the services will be operated daily and a more intensive use made of the aircraft and flying personnel.

London-Cape Town Survey Flight

MR. ALAN COBHAM has been delayed at Mongalla, waiting for supplies, but during the wait the party enjoyed some good big-game shooting. The journey was resumed on January 10, and they arrived safely at Jinja, 4,890 miles from home.

Master of Sempill Flies Home from Ireland

AFTER waiting for some days at Belfast for better weather conditions, Col. the Master of Sempill, started off on his return flight to Stag Lane, in the D.H. "Moth" light aeroplane (60 h.p. A.D.C. "Cirrus"), on January 5. During the trip across the Irish Channel to Stranraer, he encountered dense fog, and experienced great difficulty in locating the aerodrome at Stranraer, owing to bad visibility, having to make a circuit *via* the Mull of Galloway before he eventually landed. Although conditions were still bad, he decided to continue on to London, but by the time he arrived over Kirkcudbright the fog was so dense he was forced to return to Stranraer, and await better conditions. Matters had not improved very much the next day, when he set out, at 10.30 a.m., once again from Stranraer, visibility being poor, and there was a strong head wind. He had to fly at about 1,500 ft. when crossing the Solway Firth, in order to keep above the clouds. As a result, he steered a little too far inland when over the Lake District, and had to make a detour through a valley so as to strike the correct course along the shore again. This accomplished, he flew at an altitude of about 30 ft. along the borderland of sea and shore to Morecambe Bay, *via* Barrow, and thus escaped the full force of the wind. At Southport, he landed on an island sandbank—in order to avoid a crowd of well-meaning "helpers"—and replenished

the tanks with petrol from the spare supply he carried with him, and then took off once again. Another halt was made at the Sealand Aerodrome at Shotwick for fuel, after which he continued, through rain squalls, as far as High Wycombe. Here it was necessary to land in a convenient field to fill up again with petrol (from spare cans), and then he completed the last stage to Stag Lane without further incident, landing at 4.30 p.m.

Japanese Airmen Home

MAJ. ABE and Mr. Kawachi, the Japanese airmen who accomplished a successful flight from Tokyo to Europe last year, arrived back in Tokyo on January 10, and received an extraordinarily enthusiastic welcome.

An Aero Club for Dublin

FOLLOWING on the recent visit to Ireland of Sir Sefton Brancker, the first Free State aeroplane club has just been formed in Dublin. A temporary committee has been formed, and the Governor-General has signified his intention of supporting the Club.

Imperial Air Routes

SQUAD-LEADER A. CONINGHAM, leader of the recent R.A.F. flight from Cairo to Kano and back, has been sent to Nairobi to attend a conference of the Governors of Kenya Colony, Tanganyika, and Uganda, on the subject of African air routes, especially from Kisumu to Khartoum. A second official survey party is also being sent along the 2,500-mile air route between Cairo and Karachi with the object of consolidating the work of the previous expedition.

Personals

Married

Air Vice-Marshal HENRY ROBERT MOORE BROOKE-POPHAM, C.B., C.M.G., D.S.O., Principal of the Royal Air Force Staff College, at Andover, and only son of the late Mr. Henry Brooke, of Wetheringsett, Suffolk, was married at All Saints Parish Church, Ledsham, near Castleford, Yorkshire, on January 5, to Miss OPAL MARY HUGONIN, niece of Sir Granville Wheeler, M.P., and Lady Wheeler, of Ledston Hall, and younger daughter of Mr. Edgar Hugonin and the late Mrs. Hugonin. Air-Commodore Veset Holt, C.M.G., D.S.O., was best man, and there was a reception at Ledston Hall.

Flight-Lieut. A. G. BOND, A.F.C., R.A.F., eldest son of the late A. J. Bond and Mrs. Bond, of Walford, Herefordshire, was married on January 8, at St. James's Church, Piccadilly, to HYLDA OLIVE PALES, daughter of Mr. and Mrs. W. Pales, of Alexandra Park.

On January 2, at St. John the Evangelist, Penge, ERNEST RONALD HENSHAW COOMBS, R.A.F., was married to GWENDOLEN EILEEN MARY, youngest daughter of Mr. and Mrs. JOHN E. WEBSTER, of 18, Queen Adelaide Road, Penge.

HERBERT CYRIL, Flying Officer R.A.F., Hawkinge, Kent,

eldest surviving son of Mr. and Mrs. H. R. LEE, of Longdon, Wellington, was married on January 6, at St. Chrysostom's Church, Victoria Park, Manchester, to EDITH MAUD, only daughter of Mr. and Mrs. CHARLES R. MILLAR, of Manchester.

The marriage arranged between Flight-Lieut. C. E. V. PORTER, R.A.F., and Mrs. C. C. DENISON took place quietly in London on Thursday, December 17.

To be Married

The marriage between Mr. DOUGLAS FIELD, R.A.F., and Miss JOAN ASHWIN will take place at St. Mary-le-Strand at 2.15 on the 16th inst.

The engagement is announced between A. H. H. MACDONALD, R.A.F., son of the late Capt. A. MacDonald and of the Comtesse de Prehn, and BARBARA, elder daughter of Lieut.-Col. and Mrs. WORSLEY-GOUGH, of 3, Buckingham Gate, S.W., and The Thatched Cottage, Pangbourne, Berks.

The engagement is announced between MERVYN MINTER (late Capt. R.F.C. and R.A.F.), son of Mr. and Mrs. A. R. Minter, of Sydney, and DOROTHY, elder daughter of Mr. and Mrs. F. BUSHBY WILKINSON, of Sydney, N.S.W.



Royal Air Force and the Royal Aero Club

It is now some considerable time ago that the Royal Aero Club decided to offer to R.A.F. officers special facilities for becoming members of the Royal Aero Club, and the subscription fee was consequently reduced to half in their case. In spite of this fact, it is to be regretted that the support given to the Royal Aero Club by R.A.F. officers is far from being as great as might have been expected, and especially does there appear to be a scarcity of senior officers of the R.A.F. In view of the valuable work which the R.Ae.C. is doing, not only in its main sphere of organising races and competitions, but in many other directions, one might have expected the R.A.F. to show to a much greater extent its appreciation of the good work done by the Royal Aero Club. It should not be overlooked that the Club has done, and is doing, a very great deal of charitable work, most of which is to the direct benefit of officers serving in the R.A.F. Thus, we may mention that on the outbreak of war, the Royal Aero Club raised a fund to assist dependants of officers killed in the war, and already something like £20,000 has been distributed. Monthly grants to 30 families are being paid out for the purpose of contributing to the education of quite a large number of children of officers and ratings of the R.A.F., who were left unprovided for.

In addition, the Royal Aero Club, through its energetic Secretary, Commander H. E. Perrin, takes an active interest in other charities connected with the R.A.F. and other services. For instance, Commander Perrin represents the Royal Air Force on the Council and Executive of the Officers' Association, British Legion, and Officers' Benevolent Department, and he is on the Advisory Council of Lord Haig's Services Fund. He is also on the Executive of the Royal Air Force Memorial Fund, and is Chairman of the Grants Committee of that Fund. We are quite sure that the comparatively scant support, in the form of memberships, by the R.A.F. in general is only due to a lack of appreciation of all the Royal Aero Club is doing, and that once this has been pointed out to officers of the R.A.F. and R.A.F. Reserve, there will be many who will instantly come forward, especially as the subscription fee in their case is but £3 3s.

Economy—and Airships

In order to secure economy, the Government has made a drastic curtailment of the original airship programme, with the result, it would seem, that once again progress in the development of the lighter-than-air side of aeronautics in this country will be held in check. In addition to the decision not to proceed with the reconditioning of R.36 further experimental flying with R.33 has been suspended. Pulham has been reduced to a "care and maintenance" station, and members of the crew of R.33 have received notices of discharge (essential members of the crew are being retained). Cardington station is also feeling the axe, while it is rumoured that work on the new "five-million" rigid, R.101, will be spread over a longer period than was originally intended. So let us have that "light airship club."

The Next Schneider Cup Contest

At a meeting of the General Committee of the International Federation of Aeronautics, held in Paris, on January 11, at which Mr. Lahm (U.S.A.) presided, and 14 nations were represented, it was decided that the regulations of the Schneider Cup Contest should not be modified for the next race. It was proposed by France that competing machines should carry a deadweight of 250 kgs. (550 lb.), in addition to pilot and fuel. Italy also made a similar proposal, the weight proposed being 400 kgs. (882 lb.), and further suggested that each machine should be capable of a minimum speed of 113 k.p.h. (70 m.p.h.). Both the British and the American representatives opposed these proposals, which were rejected. It is not yet decided whether the next contest will be held this year (October 24) at Hampton Roads, as fixed by the American authorities, and efforts are being made to get the contest postponed until next year.

An Australian-New Zealand Flight?

The Australian airman, Mr. Kingsford Smith, has applied to Mr. Bruce, the Prime Minister, for assistance for a flight in the Widgeon flying boat from Australia to New Zealand.

Fokkers in America

ACCORDING to a message from Detroit, Mich., the Continental Motors Corporation, which company supplies the well-known Red Seal motors to numerous American motor-car manufacturers, has placed an order with the Fokker Aircraft Co. for a type F. VII-3m, three-engined monoplane, for use in connection with their business. The plants of this company being spread over the State of Michigan, the communication between the various factories was most unsatisfactory, due to the loss of time and enormous expenses. In order definitely to eliminate these drawbacks, they decided to purchase an aeroplane, and induced by the brilliant results recently obtained with the three-engined Fokker Monoplane, this machine was chosen. It is intended to use the machine chiefly for the transport of the staff in charge of the regular inspection of the company's factories. In the opinion of the Continental Motors Corporation, this purchase will mean the following advantages: Decrease of the number of high-salaried superintendents; as a consequence, considerable decrease of the enormous travelling expenses; simplification of the inspection because all inspection matters can now be dealt with by the same persons; and last, but not least, means of speedy transportation in urgent cases.

As a result of the campaign for better and regular civil aviation in the United States, several air lines, backed by the big American industries, have lately been opened. Especially for long distances, these air services prove to meet a long-felt necessity. A little while back a new air line, New York-Cuba, via Florida-Key West, was opened, on which a three-engined Fokker F. VII-3m has been put into service. On the occasion of the first flight of this machine on the approximately 2,500 miles long route, 90 miles of which are flown over the ocean, Mr. Fokker himself was one of the passengers.

THE ROYAL AIR FORCE

London Gazette, January 5, 1925.

General Duties Branch

Pilot Officer H. R. F. Baxter is promoted to rank of Flying Officer (June 19, 1925); Observer Officer W. H. Dunton is placed on retired list on account of ill-health (Jan. 6); Pilot Officer H. W. P. Stewart is transferred to Reserve, Class A (Dec. 23, 1925); Flying Officer B. P. Jones is transferred to Reserve, Class C (Jan. 4); Pilot Officer on probation E. G. Rosling relinquishes his short-service commission on account of ill-health (Jan. 2); Flight-Lieut. W. J. Dew, M.B.E. (Capt., Queen's Royal Regt.), relinquishes his temporary commission on retirement from the Army (Jan. 1).

Stores Branch

Pilot Officer B. W. Hemsley is confirmed in his appointment, and is promoted to rank of Flying Officer (Nov. 25, 1925).

Reserve of Air Force Officers

Squadron Leader H. R. Raikes, A.F.C., is promoted to the rank of Wing Commander (Jan. 1). The follg. are confirmed in rank (Dec. 30, 1925):—Flying Officer H. Lawson, Pilot Officer A. Prescott, Flying Officer C. B. M. Dale is transferred from Class C to Class B (Dec. 5, 1925); Flying Officer H. Soulsby resigns his commission (Dec. 23, 1925). The commission of Pilot Officer on probation J. F. O. Coleman is terminated on cessation of duty (Dec. 19, 1925).

Princess Mary's R.A.F. Nursing Service

Staff Nurse Miss G. R. Jones is placed on the retired list on account of ill-health (Dec. 31, 1925).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Group Captain.—R. C. M. Pink, C.B.E., to R.A.F. Depot, pending disposal on transfer to Home Estab. 15.12.25.

Wing Commanders.—A. S. Barrett, C.M.G., M.C., to School of Army Co-operation, Old Sarum, pending taking over command, 14.1.26. W. L. Welsh, D.S.C., A.F.C., to Station H.Q., Kenley, to command, 11.1.26. S. W. Smith, O.B.E., to H.Q., Cranwell, for Administrative duties, 21.1.26.

Squadron Leaders.—M. Henderson, D.S.O., to R.A.F. Depot, on transfer to Home Estab., 20.12.25. H. A. Tweedie, O.B.E., A.F.C., to R.A.F. Depot, 1.1.26. H. M. Probyn, D.S.O., to R.A.F. Depot, on transfer to Home Estab., 20.12.25. W. B. Farrington, D.S.O., to R.A.F. Depot, on transfer to Home Estab., 18.12.25.

Flight Lieutenants.—A. Chapman, to Inland Area Aircraft Depot, Henlow, 19.1.26. E. J. Cuckney, D.S.C., to Sch. of Tech. Training (Men), Manston, 8.1.26. F. J. W. Mellersh, A.F.C., to Central Flying Sch., Upavon, on transfer to Home Estab., 12.1.26. W. T. S. Williams, D.S.C., to remain at R.A.F. Depot, instead of to School of Tech. Training (Men), as previously notified.



London Air Defence Appointment

The following appointment is announced by the War Office:—

Col. A. F. Thomson, D.S.O., to command the 26th London Air Defence Brigade, T.A., in succession to Col. D. H. Gill, C.M.G., D.S.O. (June 18).

R.A.F. Apprentices at Halton

On January 7 the 1923 entry of aircraft apprentices at Halton were inspected and passed out by Air Vice-Marshal Sir Philip Game, who also inspected the school. The Commandant, Air Vice-Marshal C. L. Lambe, said that that entry was the third to complete the course at Halton, and of the apprentices originally enlisted, 40 were passed to Flower Down for training as wireless operator mechanics and 27 had been transferred to other entries. Those passing out had been trained as aero engine fitters, carpenters, riggers, coppersmiths, turners, carpenter motor-body builders, and button makers. The following were the results of the final examination:—Aircraft apprentices classified leading aircraftsmen, 64; classified A.C.1, 223; classified A.C.2, 98; failed, 9; not examined owing to sickness, 2. The following awards were made:—Cadetships, 6; aircraft apprentices recommended for corporal's advanced course, 8. The educational standard was about equal to that of previous entries, and the standard of manual dexterity had been fully maintained.

The Royal Air Force Memorial Fund

The usual meeting of the Grants Sub-Committee of the Fund was held at Iddesleigh House, on January 7. Lieut.-Commander H. E. Perrin was in the chair, and the other members of the committee present were: Mrs. L. M. K. Pratt-Barlow, O.B.E., Sqdn.-Ldr. E. B. Beaman. The committee considered in all 15 cases, and made grants to the amount of £108 1s. 8d. The next meeting was fixed for January 21, at 2.30 p.m.

Anti-Air Police

BODIES of volunteer police are now being raised in Kent, Sussex, and Essex in connection with a scheme for the defence of London against aircraft. The men are being enrolled by the chief constables of the counties and they will be trained to undertake ground observation work of the movements of aircraft at various points.

R.Ae.C. Monthly House Dinner

The Third Monthly House Dinner will be held at the Royal Aero Club on Wednesday, January 20, at 7.30 p.m. The subject for discussion will be "The Auxiliary Air Force," and the debate will be opened by the Chairman.

H. E. Searson, D.F.C., to No. 4 Sqdn., S. Farnborough, 15.1.26. P. E. Maitland, A.F.C., to R.A.F. Base, Calshot, 24.1.26.

Flying Officers.—J. G. Murray, to R.A.F. Station, Donibristle, 8.1.26. G. N. P. Stringer, to No. 39 Sqdn., Spittlegate, 11.1.26. F. B. Robinson, to R.A.F. Depot, 11.1.26. O. R. Pigott, to No. 2 Flying Training Sch., Digby, 14.1.26. J. B. Townsend, to Record Office, Ruislip, 19.1.26. W. C. Adams, to R.A.F. Depot, on transfer to Home Estab., 5.12.25.

Medical Branch

Wing Commander.—J. MacGregor, M.C., M.D., to R.A.F. Hospital, Halton, to command, 7.1.26.

Flying Lieutenant.—A. E. Barr-Sim, M.B., to Superintendent, R.A.F. Reserve, Northolt, 30.1.26.

Flying Officer.—D. B. Smith, M.B., to Elec. and Wireless School, Flowerdown, 11.1.26.

NAVAL APPOINTMENTS

The following appointments were made by the Admiralty on Jan. 4:—Lieuts., R.N. (Flying Officers, R.A.F.).—H. M. S. Forbes, D.S.C., and C. R. Townsend, to R.A.F., Training Base, Leuchars (Jan. 4).

Lord Edward Grosvenor. Members wishing to attend are requested to send in their names at once to the Secretary as the number is limited to sixty. Dinner 5s. Morning dress. The subject for the February Monthly Dinner will be "Private Flying." The date will be announced later.

The New German Air Transport Co.

The formal amalgamation of the two German air transport concerns, the Aero-Lloyd and the Junkers' Air Transport Co., was concluded on January 6 with the formation of a provisional organising company, under the name of Deutsche Lufthansa, with Herr Merkel and Herr Wronsky (Aero Lloyd), and Herr Milch (Junkers) on the executive board.

German Night-Flying Services

The night air mail service, on the Berlin-Hamburg route, which was in operation from July 1 to October 1, 1925, has during these three months transported more than ten tons of mails, newspapers and goods, and 93 per cent. of the scheduled flights were carried out. In July and August the figure was increased to 100 per cent., as not one flight was omitted. The experimental night service operated by the Junkers Company between Copenhagen and Warnemunde was suspended on November 30 last, having been in operation for 2½ months. This service will, it is expected, be resumed next spring.

High Efficiency on Rotterdam-Copenhagen Service

The figures for the K.L.M. air service between Rotterdam and Copenhagen, from April 20 to October 31, 1925—when the service was suspended—are as follows:—Passengers, 978; goods, 21,639 kgs.; parcels post, 1,333 kgs.; mails, 590 kgs. In the Rotterdam-Copenhagen direction, 99 per cent. efficiency was maintained, only two flights being cancelled on account of unfavourable weather. In the opposite direction, the figure was 98 per cent. This service will be resumed, with larger and faster, machines next April—the daily service to Bremen and Hamburg being still maintained.

Jupiter-Fokkers for "K.L.M."

The original fleet of Fokker monoplanes operated by K.L.M. on its various air services having become out of date, this company has decided to dispose of the former, and acquire more up-to-date machines. It may be of interest to note that some recent tests with a Fokker F.VIIA fitted with a Bristol "Jupiter" engine have shown such excellent results that the K.L.M. has placed an order with the Fokker Works for several of these machines. This particular model, which accommodates eight passengers and two pilots, attains a cruising speed of 170 kms. per hour (155.4 m.p.h.), whilst the general performance, climb, and stability are said to be excellent.

"PROFESSIONAL NOTES," No. 42

THE Air Ministry, Meteorological Office, has just issued "Professional Notes," No. 42, under the title of "The Investigation of the Winds in the Upper Air from Information regarding the Place of Fall of Pilot Balloons and the Distribution of Pressure," by J. Durward, M.A. This note discusses the horizontal displacement of pilot balloons in relation to the distribution of pressure. The data used are obtained from post-cards, on which the date, place and time of origin are entered, attached to pilot balloons. These balloons are released three or four times a day at many stations, and the finder is requested to return the card after entering the place and time of finding. During 1923, over 1,000 cards were returned, and it is found that on about 80 per cent. of these occasions the direction of the displacement of the balloon was within 40 deg. of the direction of the surface isobars. Certain cases are noted in which the direction of displacement differs very much from the run of the surface isobars; these cases are generally found to be associated with low-pressure systems. On the south side of the centre of a depression the westerly wind may attain a very high speed; one definite case was found in which the maximum speed at 25,000—30,000 ft. must have been over 200 miles per hour. This method of investigation is attended by so many uncertainties, that it is on the whole inferior to the careful observation of high clouds. On the other hand, it is practicable in all weathers. Copies of the publication can be obtained from all branches of H.M. Stationery Office, or through any bookseller. Price 1s. 6d. Postage ½d. extra.



Air Mails during 1925

THE Postmaster-General communicates the following particulars of outgoing British Air Mail traffic during 1925. There has been an increase in the total weight of letter mail during the year, and the total weight despatched by air has now risen to 15,520 lbs. The increase has been most marked in the mails to Paris and to Morocco and Algeria, which have increased by 19 per cent. and 33 per cent., respectively. By the latter service 2,500 lb. of letters were despatched during the year. One of the heaviest of the letter mails is that for unoccupied Germany (Hanover, Berlin and Hamburg). This increased by over 10 per cent.; and the mails for Belgium, and for Denmark, Norway and Sweden also showed increase. Considerable use was made of the air services established in Continental countries to supplement the service afforded by Imperial Airways where necessary; and new letter air mails were instituted to the East Baltic countries and Russia, the latter of these attracting as much as 680 lb. of letters in the four months of 1925 during which it was in operation. This service has occasionally been used in the inward direction for mails from the East brought by the Trans-Siberian Railway; the course of post from Shanghai to London has thus been reduced to about 15 days. Facilities for using the New York-San Francisco air mail service were also made available in May last, but hitherto little use has been made of the service. The Cairo-Baghdad service has worked with marked regularity. It continues to carry a considerable volume of mails in spite of the competition of the trans-desert motor service between Haifa and Baghdad. The air parcel service continues to carry a substantially greater volume of mails than the letter service. The total weight of the parcel air mails on the whole of the Continental services in operation was 50,000 lb., apportioned among the several services as follows: Paris, express 13,600 lb., non-express 10,200 lb., Holland 13,200 lb.; Germany, including the Rhine Army, 13,000 lb.

The Aero Golfing Society

THE following is a list of fixtures of the above society for 1926:—

- March 1.—Team Match, Ae.G.S. v. Stage Golfing Society, at Oxhey Golf Club.
- March 18.—Winter Meeting, at Addington Golf Club, for Ae.G.S. Challenge Cup, presented by Sir Samuel Instone.
- April 10.—Team Match, Ae.G.S. v. Moor Park Club, at Moor Park, Rickmansworth.
- May 6.—Spring Meeting, at Huntercombe Golf Club, for Ae.G.S. Challenge Cup, presented by the proprietors of FLIGHT.
- June 12.—Team Match, Ae.G.S. v. Frilford Heath Golf Club, at Frilford Heath, near Abingdon.
- July 15.—Team Match, Ae.G.S. v. R.A.F. Club (course to be arranged).
- October 14.—Autumn Meeting, at Wentworth Park, Virginia Water Golf Club, for Ae.G.S. Challenge Cup, presented by Cellon (Richmond), Ltd.

COMPANY DOINGS

The De Havilland Aircraft Co., Ltd.

THE annual meeting of the De Havilland Aircraft Co., Ltd., was held on December 22, at which the chairman Mr. A. S. Butler, said he was pleased to state that the very successful results hitherto attained had been well maintained, and that there was a substantial increase in turnover made since the formation of the company five years ago. Referring to the more particular records of the past year, he drew attention to, firstly, the production of the "Moth" (D.H.60) light aeroplane, which was produced in response to the growing demand for a machine on which flying training could cheaply and efficiently be carried out by the light aeroplane clubs. He was pleased to say that these machines had given every satisfaction, and furthermore, there were already two private owners of "Moths." Secondly, he referred to the highly successful flight by Mr. Cobham, on a D.H.50, to India and back, carrying Air Vice-Marshal Sir Sefton Brancker. It was due entirely to the proved efficiency of these machines, as evinced by this and previous flights, that they were now being built under licence in Belgium, Czechoslovakia, and Australia. The chairman then referred to the growing demand for the company's products from all parts of the world. Both military and civil sides of the company's business had been developed together. A resolution to pay a dividend of 10 per cent. was passed unanimously.

Rolls-Royce, Ltd.

THE directors, in their nineteenth annual balance sheet and report for the year ended October 31, 1925, state that after paying or providing for all trading expenses and suitable depreciation of buildings, machinery and plant, and charging repairs and replacements to revenue, there is available for distribution the sum of £165,722 11s. 4d., together with the amount of £18,671 16s. 1d. carried forward from the previous year. The usual rate of depreciation has been applied to the value of buildings and plant. Both the company's models, the "New Phantom" (40-50 h.p.) and the new 20 h.p. chassis, and their aero engines, continue to be in great demand.

The directors recommend a dividend of 8 per cent. per annum (subject to income tax), £65,102 19s. 3d.; transfer to income tax account, £25,000; to reserve fund, £75,000; and to carry forward to next year, £19,291 8s. 2d.



AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

APPLIED FOR IN 1924

Published January 14, 1926

- 21,994. S. E. SAUNDERS. Flying-boats, etc. (224,520.)
- 25,432. DOUGLAS MOTORS, LTD., and S. L. BAILEY. Engines. (244,558.)
- 25,433. DOUGLAS MOTORS, LTD., and S. L. BAILEY. Mechanical starting devices for engines. (244,559.)
- 26,544. M. WOLF and A. MERTZ. Portable or other engines. (244,564.)
- 27,711. C. H. CLAUDEL. Aeroplanes. (244,569.)

APPLIED FOR IN 1925

Published January 14, 1926

- 11,226. Luftschiffbau Zeppelin Ges. Rigid airships. (240,406.)

Secret Patent Re-assigned to the Inventor

APPLIED FOR IN 1918

Published January 14, 1926

- 541. A. M. Low. Aerial Projectile. (244,258.)
- 5,632. A. M. Low. Control of torpedoes, etc. (244,302.)

FLIGHT

The Aircraft Engineer and Airships

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